A large number of barriers and corridors on state forest land are natural features, such as topography and unique physical features.

In addition, state forest land contains many man-made barriers and corridors from past activities. They include roads, facilities, clearcut and timbered areas, recreational areas, utility rights of way, gravel pits and other surface mining operations.

Roads function as complete physical barriers to movement of some terrestrial invertebrates and as partial barriers (deterrents) to movement of some small, terrestrial vertebrates. On the other hand, roads apparently serve as convenient movement corridors for many animal species.

Roads create significant barriers when in or near the following types of key wildlife habitat: 1) nest sites of peregrine falcon, bald eagle, osprey, spotted owl and herons; 2) beaver ponds; 3) big game winter ranges; and 4) streamside management zones, including nest sites of the golden eagle and winter feeding and roosting habitat of the bald eagle.

Table 29 shows the territorial range of select species. Animals with small territories may be well protected by preserves; those with wide ranges will receive less than total habitat protection. Because of financial restrictions facing land management agencies, the protected habitat of certain wide-ranging species may only include core areas. Legislation, however, may require more extensive protection.

TABLE 29
Territorial Range of Select Species

Species:	**Home Territory:**	**Migratory Range:**
Arctic peregrine	.2 to 120 miles	Arctic Canada to Chile
Wolf	20 to 260 square miles	Rarely migrates
Columbian white-tailed deer	270 to 470 miles	N/A
Northern Spotted Owl	1.8 to 2.2 mile radius (per pair)	N/A
Bald Eagle	1 to 2 miles	40 to 50 miles
Cougar	25 to 50 miles	N/A
Elk	25 to 50 miles	N/A
Coyote	5 square miles	N/A
Blacktail deer	1 square mile	N/A
Mule deer	1 square mile	N/A

7.5 SOCIAL EFFECTS

7.5.1 Noise

A typical forest has a steady background noise level, the sum of many distant sources. Superimposed on it are individual "local" sounds, which can vary from an occasional bird song or aircraft to the virtually continuous noise from a rushing stream. To assess the impact of noise, the additional noise is superimposed on existing noise so the combined noise and the increase can both be evaluated.

From an acoustic standpoint, there are two types of state forest lands: 1) those in remote locations, generally inaccessible to the public and influenced by few, if any, human sources of noise; and 2) those closer to human population and subject to various human-generated sound (such as traffic, aircraft, trains, industries and homes). Most of the department's forests fall into the first category.

Ambient or background noise levels are commonly 20 to 35 dBA in remote forests. Wind blowing through treetops, rustling leaves and branches, moving water, rainfall, wildlife and even insects are examples. The lowest background level measured on state forest land is 27 dBA. This measurement was in a forest void of mechanical or other noise generated by man. On the other hand, in commercial forests located near human habitation or areas of extensive activity the ambient-sound levels were higher, from 30 to 45 dBA, with instantaneous peaks up to 60 dBA or more.

7.5.2 Light and Glare

The amount of sunlight reaching any part of a forest depends on many factors, including seasonal variations, time of day and weather. Structure and composition of the forest also have much to do with sunlight intensity. Following a catastrophic event, such as a wildfire, the forest floor receives sunlight at full intensity. The intensity decreases as more and thicker layers of vegetation intercept the sunlight. In a closed-canopy forest, little incoming sunlight reaches the forest floor.

The amount and character of vegetation at and near the forest floor is heavily dependent on the amount of sunlight. In many cases the number and type of plant species at and near the forest floor decreases as the forest community advances from early successional stages to the closed-canopy condition. This decrease is due primarily to reduced sunlight.

7.5.3 **Public Services**

7.5.3.1 Police and Fire

Most state forest land is not within the jurisdiction of municipal police departments or the normal workload of county sheriff's departments. As a result, department personnel provide nearly all the police protection and criminal investigation on state forest lands. The department has joined with other major forest landowners in several counties in contracting with county sheriff's departments for "woods patrols" to reduce, detect and investigate criminal activities. Local and state law-enforcement agencies are periodically asked for assistance in tracing stolen department equipment and suspected individuals. Problems on state forest land include vandalism, garbage dumping, and theft of forest products.

The department is the public agency responsible for fire protection on state forest land. Its fire protection program is addressed in Policy 10.

State forest land only rarely requires fire services from local public agencies. As a rule, the department-managed areas are not within the jurisdiction of municipal fire departments or rural fire districts. In some instances where the department has leased land for commercial purposes, fire protection may be provided by special agreement with adjacent fire protection agencies. These agreements, however, do not involve the department.

7.5.3.2 Schools

The department, acting as trustee, manages state forest land on behalf of various educational institutions in Washington, including common schools and universities (the beneficiaries). See the introduction to the Forest Resource Plan and Appendixes B and C for a more complete discussion of the trusts. The introduction to the Public Comment volume also contains a discussion of the trust mandate -- this discussion is identical to Appendix B in the plan. The department is under a legal duty to generate income for the trusts.

Income generated for schools is discussed below in section 7.5.7, economics.

7.5.3.3 Other Governmental Services

The Forest Resource Plan is not likely to have a significant impact on other government services. Cooperation between the department and other agencies is, however, a necessary and beneficial aspect of managing state forest lands. In some cases, state and federal laws require cooperation. In many other cases, working relationships and cooperation have been voluntary.

Each agency (including the department) is impacted to some degree by the actions of other government agencies. Cooperation helps ensure that the department's programs and activities meet the legal requirements of other entities.

7.5.4 **Transportation**

7.5.4.1 Roads and Vehicles

The department currently operates about 12,000 miles of roads on state forest lands. Of this system, about 7,500 miles are used for transportation. Another 3,600 miles are maintained for fire prevention and control. The department builds about 60 miles of new roads each year. It closes roads that it does not need and attempts to restore the areas.

Traffic is generated primarily by timber harvesting, fire control and recreational programs. These uses are dispersed across the state and cause few hazards. Traffic uses the network of forest roads, interstate highways, state highways, county roads and city streets.

7.5.4.2 Waterborne, Rail and Air Traffic

Waterborne and rail traffic are used as secondary means of transport to market. Railroad use continues to decline, however, and is used by only a few companies.

Logs exported to Pacific Rim countries, a common activity in the 1980s, were transported in large quantities by ships. Federal legislation passed by Congress in 1991 (the Forest Resources Conservation and Shortage Relief Act) restricts log exports from state forest lands. These restrictions will reduce the amount of waterborne timber.

Helicopters are sometimes used for planning roads and for timber sale preparation and inspection. Small amounts of helicopter logging are done. Helicopters are also used in site preparation, seeding, stand protection, fertilization, fire prevention and fire control. Fire detection programs make the greatest use of aircraft.

7.5.5 **Human Health and Population**

Washington's population is largely concentrated in the "Western" or "Interstate 5" corridor which links 10 counties between Canada and Oregon along the west slope of the Cascades. These counties (Clark, Cowlitz, King, Kitsap, Lewis, Pierce, Skagit, Snohomish, Thurston and Whatcom) account for about 70 percent of the state's population. Seven of these ten counties are among the most populous in the state.

Benton, Spokane and Yakima Counties make up three of the other top 10 counties, and account for 15 percent of the state's population. Other areas of significant population are Chelan, Clallam, Grays Harbor and Walla Walla Counties.

Table 30 shows the current statewide and county population figures based on the 1990 consensus.

State forest land is found in almost every county but most is not near major population centers. State forest land usually adjoins or intermixes with that of other (private or federal) forest owners.

Few people now reside on state forest lands. Permanent housing is provided only by institutional housing and youth camps. The department estimates the total population on state forest land is less than 1,000. Institutional housing is provided for adults at the Larch Mountain (Clark County), Clearwater (Jefferson County) and Cedar Creek (Thurston County) Correction Centers and the Indian Ridge Treatment Center (Snohomish County). Youth camps are located at Mission Creek (Mason County) and Naselle (Pacific County). These facilities generally accommodate approximately 500 people per year.

The department's timber harvest program contributes significantly to the nation's housing industry. State forest land accounts for approximately 10 percent of the wood volume produced in Washington and 1 percent of the national supply.

TABLE 30
Population By County
1980-90

	Census 1980	Census 1990
Washington	4,132,353	4,866,692
Adams	13,267	13,603
Asotin	16,823	17,605
Benton	109,444	112,560
Chelan	45,061	52,250
Clallam	51,648	56,464
Clark	192,227	238,053
Columbia	4,057	4,024
Cowlitz	79,548	82,119
Douglas	22,144	26,205
Ferry	5,811	6,295
Franklin	35,025	37,473
Garfield	2,468	2,248
Grant	48,522	54,758
Grays Harbor	66,314	64,175
Island	44,048	60,195
Jefferson	15,965	20,146
King	1,269,898	1,507,319
Kitsap	147,152	189,731
Kittitas	24,877	26,725
Klickitat	15,822	16,616
Lewis	56,025	59,358
Lincoln	9,604	8,864
Mason	31,184	38,341
Okanogan	30,663	33,350
Pacific	17,237	18,882
Pend Oreille	8,580	8,915
Pierce	485,667	586,203
San Juan	7,838	10,035
Skagit	64,138	79,555
Skamania	7,919	8,289
Snohomish	337,720	465,642
Spokane	341,835	361,364
Stevens	28,979	30,948
Thurston	124,264	161,238
Wahkiakum	3,832	3,327
Walla Walla	47,435	48,439
Whatcom	106,701	127,780
Whitman	40,103	38,775
Yakima	172,508	188,823

7.5.6 **Recreation and Aesthetics**

The department does not manage state forest lands primarily for parks or recreation, though in recent years it has obtained funds from the legislature to protect special ecological features. These features are managed separately by the department's Land and Water Conservation Division. The areas are protected as Natural Areas Preserves or as Natural Resource Conservation Areas. Lands in these preserves, which total about 56,000 acres, are not managed for income production and are not addressed by the Forest Resource Plan.

The department allows the public to use many state forest lands for recreation when this use is compatible with other trust obligations. Plans for recreational facilities, including economical and environmental assessments of new potential sites, are developed by the Land and Conservation Division and are also not addressed by the plan. The plan, however, contains a proposed recreation policy which calls for the department to continue complying with the Statewide Comprehensive Outdoor Recreation Program and to cooperate with the Interagency Committee for Outdoor Recreation.

A map showing recreational sites is available from Department of Natural Resources' offices.

7.5.7 **Economics**

The department generates a substantial amount of revenue each year by selling timber from state forest lands to support the trust beneficiaries. In fiscal year 1990, the department produced $189 million for the various trusts.

Table 31 shows the annual income generated on state forest lands in the 1980s. Money from Federal Grant lands supports eight specific trusts, including common school and university. Money from Forest Board Transfer lands support the county and junior taxing districts (such as schools, road and cemetery districts) in which they are located. Money from Forest Board Purchase lands support the state general fund for the benefit of public schools, in addition to the county and junior taxing districts in which they are located.

Table 32 shows the amount of money that each county with Forest Board lands received in 1990 (fiscal year). The amounts are based on the amount of timber sold in the individual county.

TABLE 31
Annual Income Generated on State Forest Lands
1980s

Year**	Trust Income	Management Funds	TOTAL
1980	$126,012,431	$37,003,568	$163,015,999
1981	78,931,205	16,798,282	95,729,487
1982	116,410,722	26,043,698	142,454,420
1983	85,626,667	27,427,410	113,054,077
1984	79,412,290	28,866,650	108,278,940
1985	88,274,510	32,228,534	120,703,044
1986	86,262,949	30,187,060	116,450,009
1987	92,621,605	32,837,735	125,459,340
1988	141,719,134	22,887,561	164,606,695
1989	151,776,272	52,524,607	204,300,879
TOTAL	**$1,047,247,785**	**$306,805,105**	**$1,354,052,890**

* Includes income from all timber sales and miscellaneous forest product leases and sales. Does not include income from land sales, rights of way or easement agreements, or income from the transfer of land from trust status to State Parks or Conservation Areas.

** Fiscal year (July 1 to June 30).

TABLE 32
Income Generated From Forest Board Lands
1990 (fiscal year)

County:	Income Received:*
Clallam	$10,600,355
Clark	1,108,815
Cowlitz	681,515
Grays Harbor	1,701,478
Jefferson	1,879,130
King	2,304,023
Kitsap	664,855
Kittitas	0
Klickitat	296,532
Lewis	780,534
Mason	246,476
Okanogan	0
Pacific	2,407,849
Pierce	884,864
Skagit	8,499,792
Skamania	2,504,893
Snohomish	3,014,743
Stevens	0
Thurston	2,288,840
Wahkiakum	756,048
Whatcom	4,819,085
TOTAL	**$45,439,825**

* Timber sales and related activity only.

7.5.8 Historic and Archaeological Sites

The department maintains an active tracking system to record historic and archaeological sites and to ensure that its activities do not damage these sites.

Location of known sites are on file with the state Office of Archaeology and Historic Preservation (OAHP) in Olympia. As new sites are discovered, these files are brought up to date. The department's system, called TRAX, is a computer-based filing and recording system that allows the department to inventory and retrieve information about sites in a particular location. The department works closely with tribes and other agencies to keep these records current.